

REMARKS

Applicant has carefully studied the outstanding Official Action. The present response is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

Applicant expresses his appreciation to Examiners Blaine T. Basom and John Cabeca for the courtesy of an interview, which was granted to Applicants' representative, Sanford T. Colb (Reg. No. 26,856). The interview was held in the USPTO on January 11, 2005. The substance of the interview is set forth in the Interview Summary.

As noted in the Interview Summary, it was agreed that the 35 U.S.C. 112, first paragraph, rejections are overcome. Accordingly, the following argument relating to that rejection is included for the sake of the record, only.

Independent claims 1, 33, 36, 41, 46, 49, 66, 71, 76 and 80 and the claims dependent therefrom stand rejected under 35 U.S.C. 112 as failing to comply with the written description requirement.

The Examiner states "The claims contain subject matter which was not described in the specification ... In particular, each of these claims recite a 'two dimensional sensor comprising at least one infrared illuminator'. The specification of the present invention, however, does not explicitly describe such a two dimensional sensor".

Applicant respectfully submits that the present application describes an electronic camera or CCD or PSD whose field of view encompasses a virtual keyboard, as well as a CMOS camera. While CCD and PSD can also refer to one-dimensional sensors, a camera is always a two-dimensional imaging device. Additionally, Applicant gives an example of CCD and CMOS cameras mounted in mobile phones and PDAs or an array of detectors:

"As seen in Figs. 21 and 24, in modified mobile device 250, a detector 292, such as detector 208 (Fig. 19) or detector 228 (Fig. 20) preferably includes a CCD camera such as a Sony ICX409AL, a CMOS camera, such as an Omnivision OV7110, a position sensitive detector, such as a Hamamatsu S1880, an array of CCD or CMOS detectors, a series of line detectors, each aligned to view a line of the projected

keyboard, or any other suitable detector" (paragraph 178 of the published application).

Applicant respectfully notes that a Hamamatsu S1880 is a one-dimensional sensor.

The Examiner also states: "Rafii similarly discloses what is understood to be a PSD ... Rafii nevertheless discloses that this PSD is implemented as a three dimensional sensor".

Applicant respectfully submits that this statement made by the Examiner is incorrect. Rafii goes out of his way to describe a system where each pixel in a sensor has specialized "time of flight" circuitry to measure the time it takes for the photons to reach the sensor and on the basis of this determine the distance to the object (Column 4, lines 7-33). Rafii's system is based on a unique three-dimensional measurement technique, and in fact a device utilizing this system is not available on the market.

Claims 1, 7, 11-12, 23-25, 32-33, 49, 51-54, 57-60 and 79-80 stand rejected under 35 U.S.C. 102(e) as being anticipated by Montellese (U.S. Patent No. 6,281,878).

At the interview, applicant proposed incorporating the recitation of claim 23 into claim 1, while specifying a single two-dimensional sensor. Similar amendments were proposed for the remaining independent claims. Applicant has amended claim 1 and the remaining independent claims as proposed at the interview, and amended the dependent claims accordingly.

The essence of the argument made by applicant at the interview, repeated here for the record, is that claim 1 as amended, includes at least one lens as part of a single two dimensional sensor. Montellese ('878) not only does not show or suggest provision of such a lens in a single two dimensional sensor, but teaches away from a lens, by specifying at column 6, lines 32 - 35 that:

"For example, an object located to the left of the sensor will reflect light towards the left side of the sensor. An object located to the right of the sensor will reflect light towards the right side of the sensor".

It is well known that lenses invert images. The very specific recitation of Montellese clearly demonstrates that no lens is employed.

Accordingly, claims 1, 7, 11-12, 23-25, 32-33, 49, 51-54, 57-60 and 79-80 are not anticipated or rendered obvious by Montellese (U.S. Patent No. 6,281,878).

Claims 2-6, 8-10, 13, 16-22, 26-29, 36, 41, 46, 50, 55-56, 61, 66, 71 and 76 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Montellese, in view of Rafii et al (U.S. Patent No. 6,614,422). Claims 14-15, 30-31 and 62-63 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Montellese, in view of Rafii et al, in further view of Kaelin et al (U.S. Patent No. 6,435,682). Claims 34, 37, 42, 47, 67, 72, and 77 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Montellese, in view of Rafii et al, in further view of Carau (U.S. Patent No. 6,266,048). Claims 38, 43, 48, 68, 73 and 78 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Montellese, in view of Rafii et al, in view of Carau in further view of Nicolas et al. (U.S. Patent No. 6,593,944).

Kaelin et al describes an image projection system for generating an energy efficient output representative of the desired input image. The image projection system includes a light source positioning device for directing the light from a light source onto a spatial light modulator. However, Kaelin does not describe connecting the projector to a sensor in order to input information into a computer system. Therefore, one ordinarily skilled in the art would not be motivated to combine the image projection system described by Kaelin with the devices described by Rafii and/or Dunton. Even if one would be so motivated, the resulting system would still be limited to the use of three-dimensional sensors as described by Rafii, or to a plurality of sensors as described by Dunton.

Carau et al describes “an improved computer or PDA with a projected display onto a substantially flat, white surface, to create a virtual computer screen display and a projected keyboard... to create a virtual keyboard”. The system taught by Carau utilizes a method of triangulation in order to project an image of a display and sense finger reflection, by using two sensor devices, as seen in Carau, Figure 3 and the description thereof. Therefore, even if one skilled in the art would be motivated to combine the devices of Carau and Rafii, the resulting device would still be limited to the use of three-dimensional sensors as described by Rafii, or to using triangulation and a plurality of sensors as described by Carau.

Nicolas et al describes a method and an electronic system for viewing a Web-page on a small-sized electronic display device, such as a PDA. However, the system and method described by Nicholas do not include projection of images onto a surface, or

sensing position or movement on a surface. Therefore, one of ordinary skill in the art would not be motivated to combine the system and method described by Nicolas with that of Rafii and/or Carau. Even if one skilled in the art would be motivated to combine the devices, the resulting combined device would still be limited to the use of three-dimensional sensors as described by Rafii, or to using triangulation and a plurality of sensors as described by Carau.

Therefore, none of the prior art, alone or in combination shows or suggests "a single two dimensional sensor comprising at least one infrared illuminator" as recited in independent claims 1, 33, 36, 38, 41, 46, 49, 66, 71, 76 and 80.

With reference to the above discussion, independent claims 1, 33, 36, 41, 46, 49, 66, 71, 76 and 80 are deemed patentable over the prior art of record and favorable reconsideration is respectfully requested. Claims 2-32, 34, 37-38, 42-43, 47-48, 50-63, 67-68, 72-73 and 77-79 depend directly or ultimately from the above mentioned independent claims and recite additional patentable subject matter and therefore are deemed patentable.

With reference to the finality of the rejection, Applicant respectfully notes that contrary to that stated in the official action, Applicant's amendment filed June 17, 2004 did not necessitate new grounds for rejection. Montellese was equally applicable to the earlier claims. If finality nevertheless remains, Applicant will file an RCE to continue prosecution.

In view of the foregoing remarks and amendments, all of the claims are deemed to be allowable. Favorable reconsideration and allowance of the application is respectfully requested.

Respectfully submitted,

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